

1966 OPERATING SUMMARY

SIMCOE

***water pollution
control plant***

ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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ONTARIO WATER RESOURCES COMMISSION
OFFICE OF THE GENERAL MANAGER

Members of the Simcoe Local Advisory Committee,
Town of Simcoe.

Gentlemen:

We are pleased to submit to you the 1966 Operating Summary for the
Simcoe Water Pollution Control Plant, OWRC Project No. 62-S-120.

It is hoped that our joint participation in efforts to combat water pollution
will have even more success in the coming year.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly", is written over the typed name.

D. S. Caverly,
General Manager.

LIBRARY COPY

NOV 23 1967

ONTARIO WATER
RESOURCES COMMISSION



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am happy to present you with the 1966 Operating Summary for the Simcoe Water Pollution Control Plant, OWRC Project No. 62-S-120.

The report offers a concise summary of operating data for the year and comparisons with previous years where these are applicable and significant.

Yours very truly,

A handwritten signature in cursive script, reading "B. C. Palmer".

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary contains complete information on the management of the project during 1966. It contains a concise review of the year's plant operation, significant financial details, and a visual presentation in graphs and charts of technical performance.

The information will be of value to interested parties in assessing the adequacy of the project at this time and its ability to meet future requirements.

The report is the result of co-operation by several groups within the Division of Plant Operations. These include the statistics section and the technical publications section. The Division of Finance and the draughting section of the Division of Sanitary Engineering were also closely associated with its publication.

The Regional Operations Engineer, however, has had the primary responsibility for the content, and will be happy to answer any questions regarding it.

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SIMCOE
water pollution control plant

operated for

THE TOWN OF SIMCOE

by the

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Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: R. S. McKittrick

801 Bay Street Toronto 5

'66 REVIEW

The total operating cost for 1966 was \$42,874.24 as opposed to \$40,334.44 in 1965. However, with the increased total raw sewage flow to the plant, the cost per million gallons was reduced from \$71.32 to \$68.23 per million gallons.

Although the percentage increase in 1966 was less than that in 1965, once again there was an increase in total flow received at the Simcoe plant. A total of 628.39 million gallons of raw sewage was treated, representing an 11% increase over the previous year. In 1966, the total design capacity at the two plants was exceeded 16% of the time as compared to 10% of the time in 1965.

There was a slight reduction in average organic loadings to the plants, but loadings were again greater than the design loadings. On the average of the year's results the effluent quality met OWRC objectives.

In 1966, a partial renovation of the aeration equipment in Plant No. 1 was completed. Utilizing used diffuser equipment, one pass of the aeration section of this plant was modified to a Sparjer installation. In addition, one of the blowers was rebuilt with a resultant increase in efficiency. Present plans are to discontinue the renovation of the aeration section until a source of used Sparjers can be located. The second blower will be rebuilt in 1967 completing that part of the renovation.

Operating costs in 1966 were somewhat higher than the anticipated operating budget due to considerable use of chlorine in an effort to control an odour problem which has given rise to complaints from residents in the south end of the Town. Some success was achieved with the chlorine. However, since the cause of the odour is from canning wastes, particularly beans in the raw sewage, it is advisable that the problem be attacked at its source. A much more economical use of chlorine could be achieved

by mixing it with the canning factory effluent rather than the entire raw sewage inflow at the plant.

In addition to the additional expense of chlorine for odour control, there were two consecutive failures on the 50 HP motors driving the aeration fans of the No. 2 plant. A revised specification on the motor winding along with a modification in the impeller hub of the fan should eliminate the problems experienced with this equipment in 1966.

A new preventive maintenance program was initiated at the plant during 1966. Together with increased experience and education of the plant staff, the maintenance program in years to come should be much more effective in eliminating costly breakdowns. The Simcoe plants present a slightly more complex maintenance problem than is normally anticipated due to the large variety and number of different pieces of equipment associated with the two separate plants.

There are two equipment problems at the Simcoe plant which, although not of a critical nature, are worthy of note at this time. Firstly the boiler presently at the plant is undersized for the existing application. Any future extension at the plant should include a new boiler of sufficient size to overcome the large heat losses between the control building and the digester.

The second problem exists with the chlorine facilities. The chlorine building and associated equipment was part of the original installation on plant No. 1. The building itself does not provide adequate storage facilities for the chlorine and, as has been pointed out by our Safety Officer, is unsafe. The chlorinator itself is the old bell jar type and does not provide an accurate control over chlorine dosages; during the period when large quantities of chlorine were being used for odour control it was not capable of delivering sufficient chlorine to the raw sewage wet well. Once again when plant expansion is contemplated consideration should be given to the installation of a new chlorine storage building and associated equipment.

The plant staff consisting of a chief operator, two operators and one groundskeeper operator together with OWRC head office staff were successful in operating two plants which maintained an effluent quality within OWRC objectives.

PROJECT COSTS

NET CAPITAL COST (Final)		\$694,205.44
DEDUCT - Portion Financed by CMHC (Estimated)	\$409,699.75	
- Payments from Municipalities	<u>37,795.29</u>	<u>447,495.04</u>
Long Term Debt to OWRC		<u>\$246,710.40</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1966		<u>\$ 19,619.19</u>
Net Operating		\$ 42,874.24
Debt Retirement		4,965.00
Reserve		4,796.69
Interest Charged		<u>13,846.55</u>
TOTAL		<u>\$ 66,482.48</u>

RESERVE ACCOUNT

Balance at January 1, 1966	\$ 13,441.31
Deposited by Municipality	4,796.69
Interest Earned	<u>794.13</u>
	\$ 19,032.13
Less Expenditures	<u>1,965.19</u>
Balance at December 31, 1966	<u>\$ 17,066.94</u>

MONTHLY OPERATING COSTS

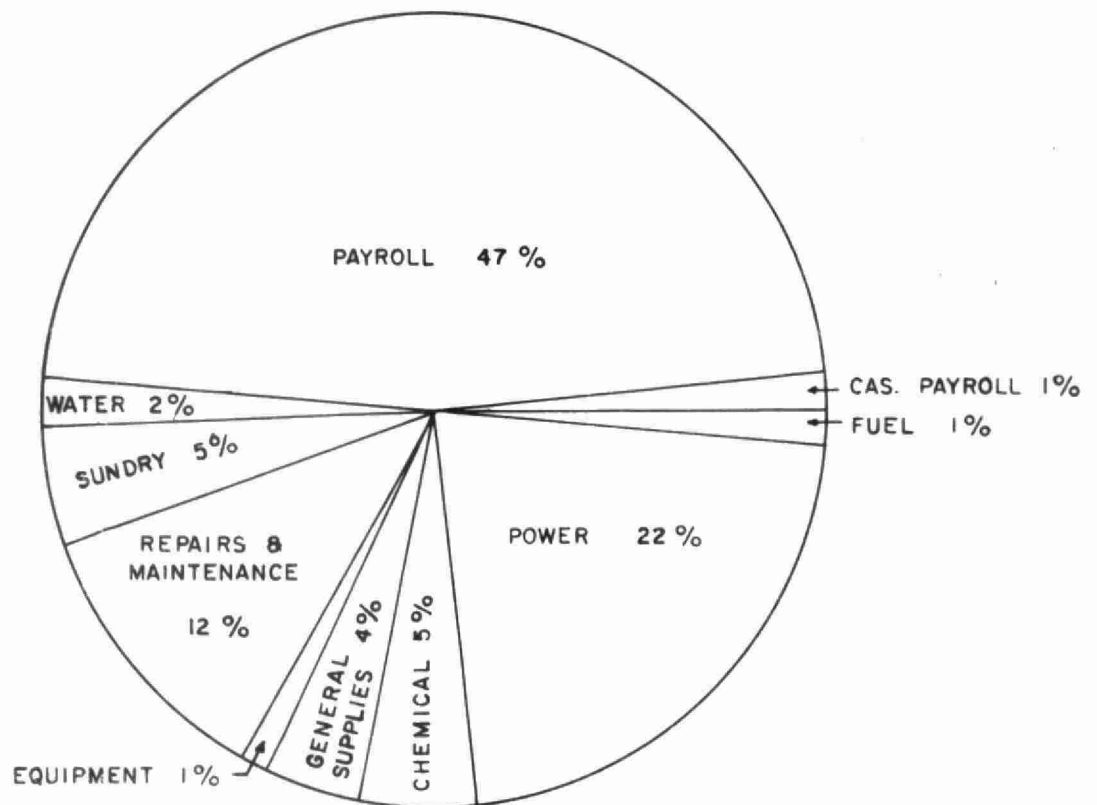
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	2520.94	1514.69		46.22	768.38		121.53	2.83	42.46		24.83
FEB	1637.06	1353.28					105.60		137.44	40.74	
MARCH	3677.10	1546.01		159.55	1478.68		93.52		291.85	55.31	52.18
APRIL	3345.49	2170.78		29.10	775.90		131.40	39.05	96.51	65.86	36.89
MAY	3626.06	1625.80			651.56	274.05	71.95	94.10	655.34	177.94	75.32
JUNE	3948.39	1734.34			770.86	280.25	127.23	90.43	722.74	135.52	87.02
JULY	4484.64	1514.86	291.84		902.50	95.51	185.88	248.35	115.98	99.13	30.59
AUG	4381.13	1653.77	231.27		860.93	822.15	209.99	14.81	486.54	23.29	78.38
SEPT	3745.53	2377.46	84.12			274.05	128.80		15.74	865.36	
OCT	4944.34	1607.68		151.98	1817.42	274.05	138.97		555.19	153.64	245.41
NOV	3295.12	1584.16			714.73		175.62		514.82	234.25	71.54
DEC	3268.44	1604.32		117.75	807.98		267.53	43.26	239.06	155.76	38.78
TOTAL	42874.24	20287.15	607.23	498.60	9548.94	2020.06	1758.02	532.83	4873.67	2006.80	740.94

YEARLY OPERATING COSTS

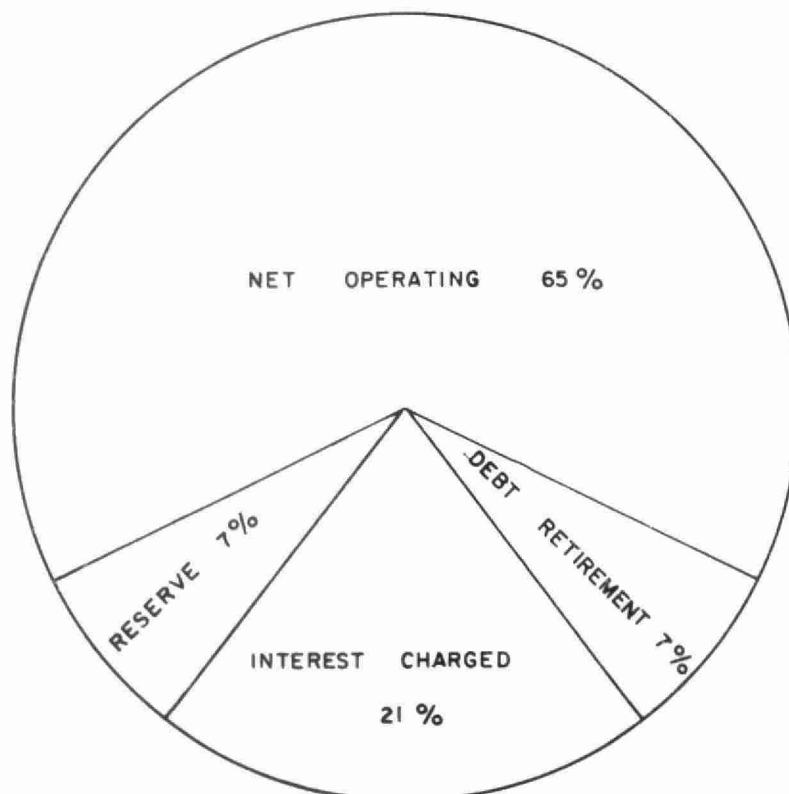
YEAR	M.G. TREATED	TOTAL COST	COST PER FAMILY PER YEAR	COST PER MILLION GALLONS	COST PER L.B. OF BOD REMOVED
1964	485,269	\$ 33517.36	* \$13.26	\$ 69.06	2 CENTS
1965	565,531	\$ 40334.44	\$15.95	\$ 71.32	2 CENTS
1966	628,389	\$ 42874.24	\$16.93	\$ 68.23	3 CENTS

* BASED ON ANNUAL POPULATION ESTIMATE AND 3.9 PERSONS PER FAMILY

1966 OPERATING COSTS



TOTAL ANNUAL COST



Process Data

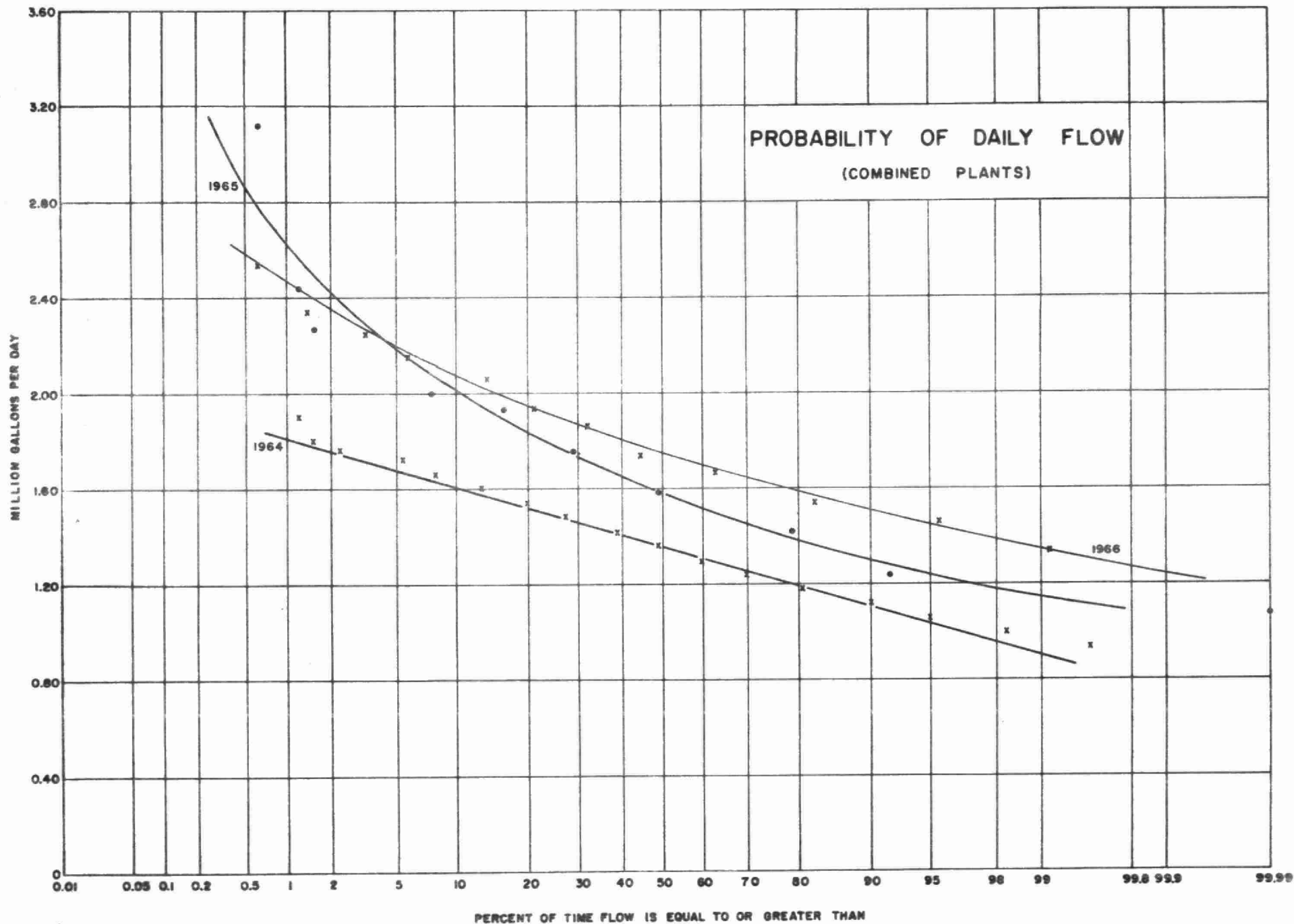
PROCESS DATA

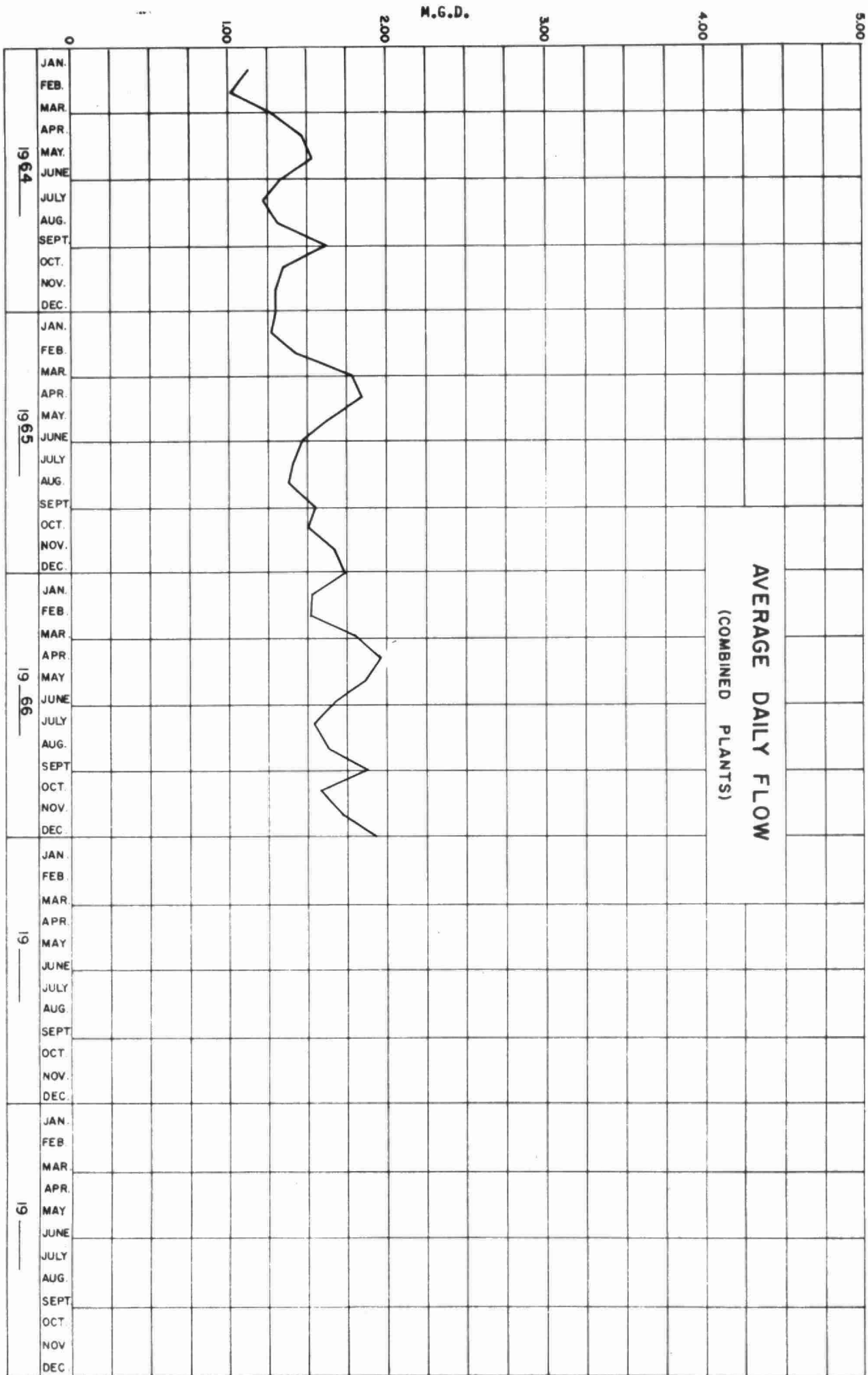
A total of 628.389 million gallons of raw sewage was treated at the Simcoe plant during 1966. This represents an 11% increase over the previous year. The average daily flow for the year was 1.72 million gallons which is a load factor on the combined plants of 86%. The maximum daily flow for any one day during the year was 2.475 million gallons and occurred in December.

On a yearly average, Plant No. 1 accepted 31% of the total flow and Plant No. 2 accepted the balance of 69%. In 1966 the total design capacity of the two plants was exceeded 16% of the time as compared to 10% of the time in 1965.

GRIT REMOVAL COMBINED

Grit removal totalled 549 cubic feet for the year for an average monthly removal of 46 cubic feet. On the basis of raw sewage flow, the average of 0.9 cubic feet per million gallons is within the range normally anticipated for a plant of this nature.

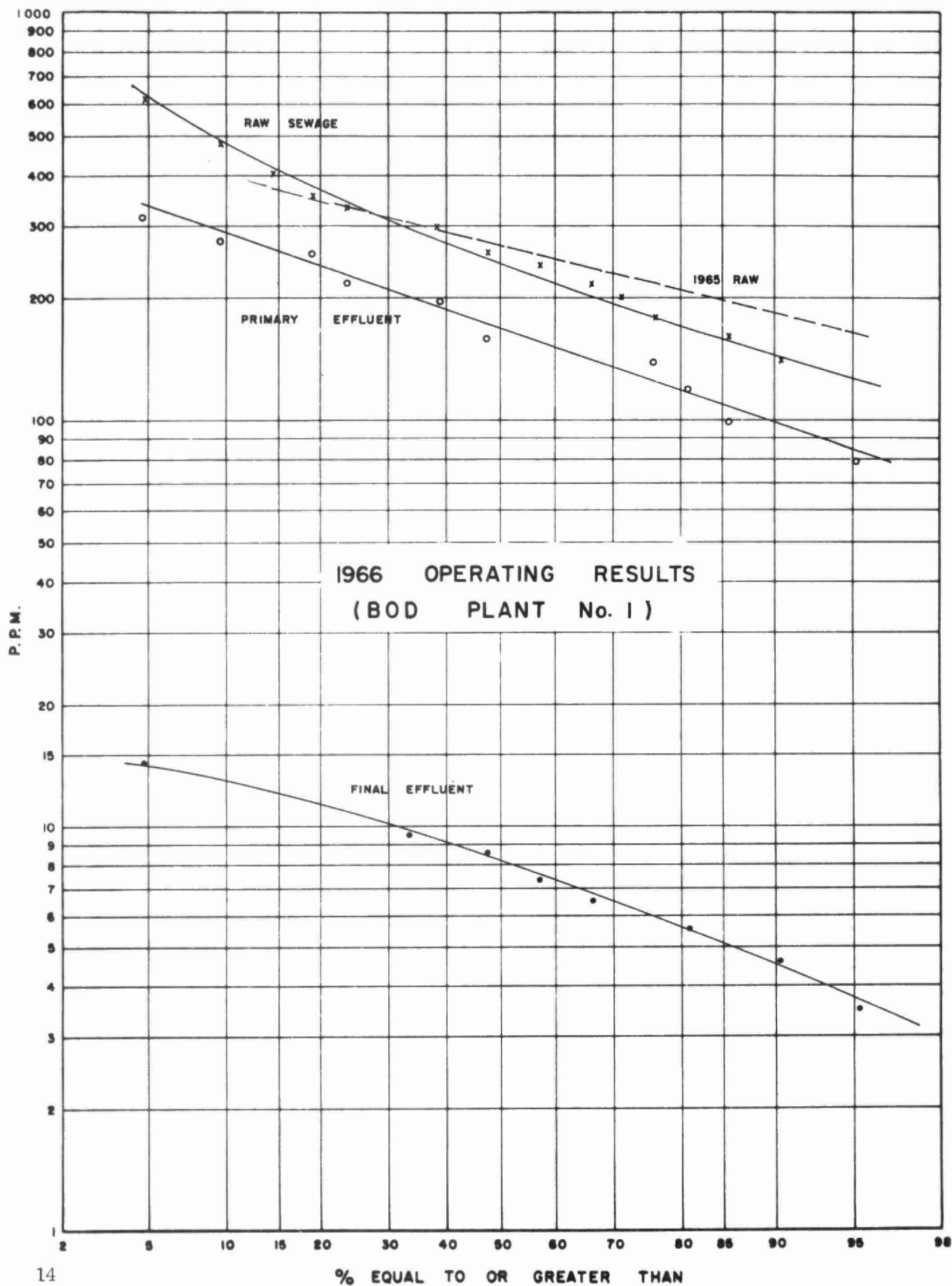


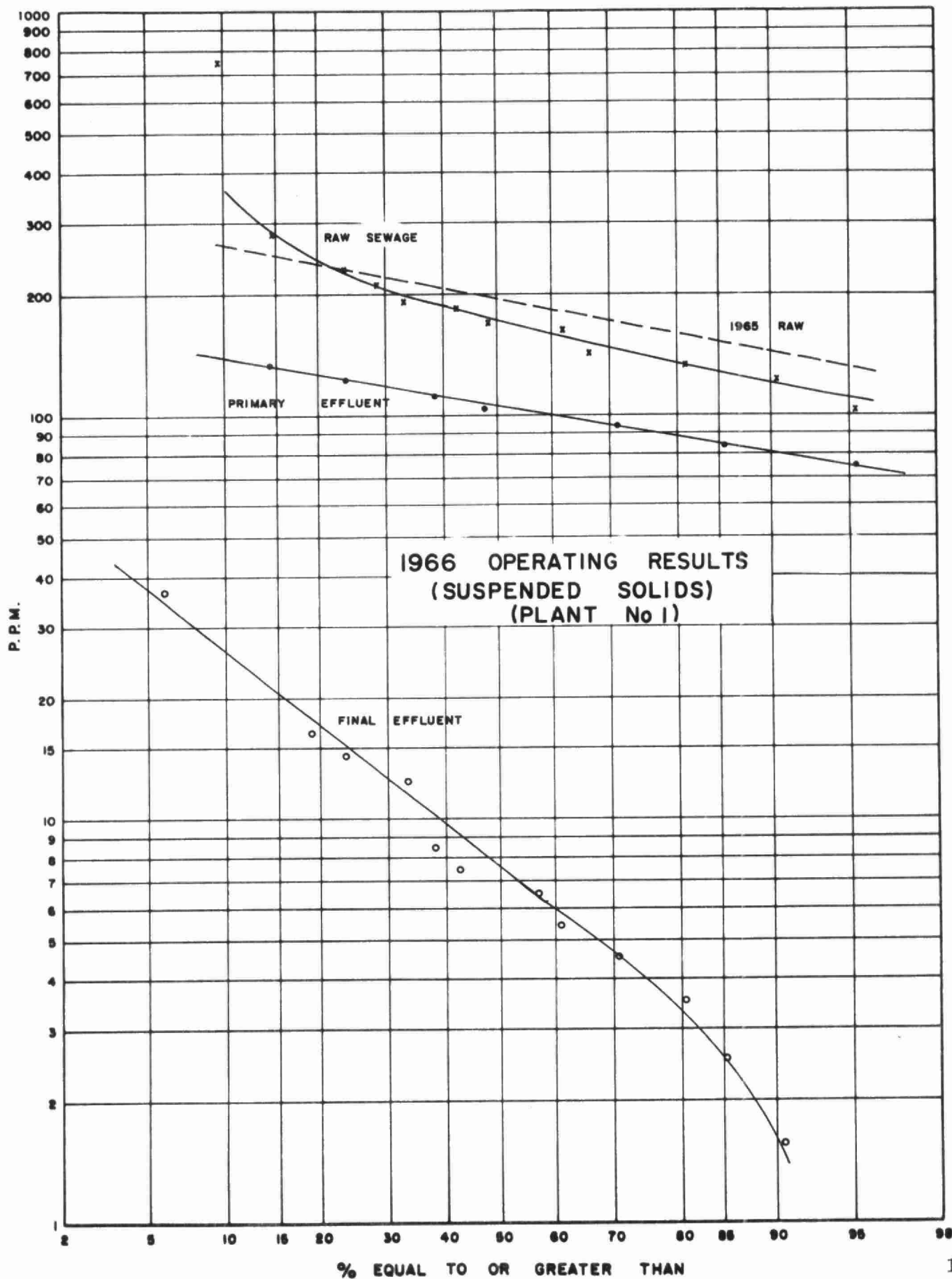


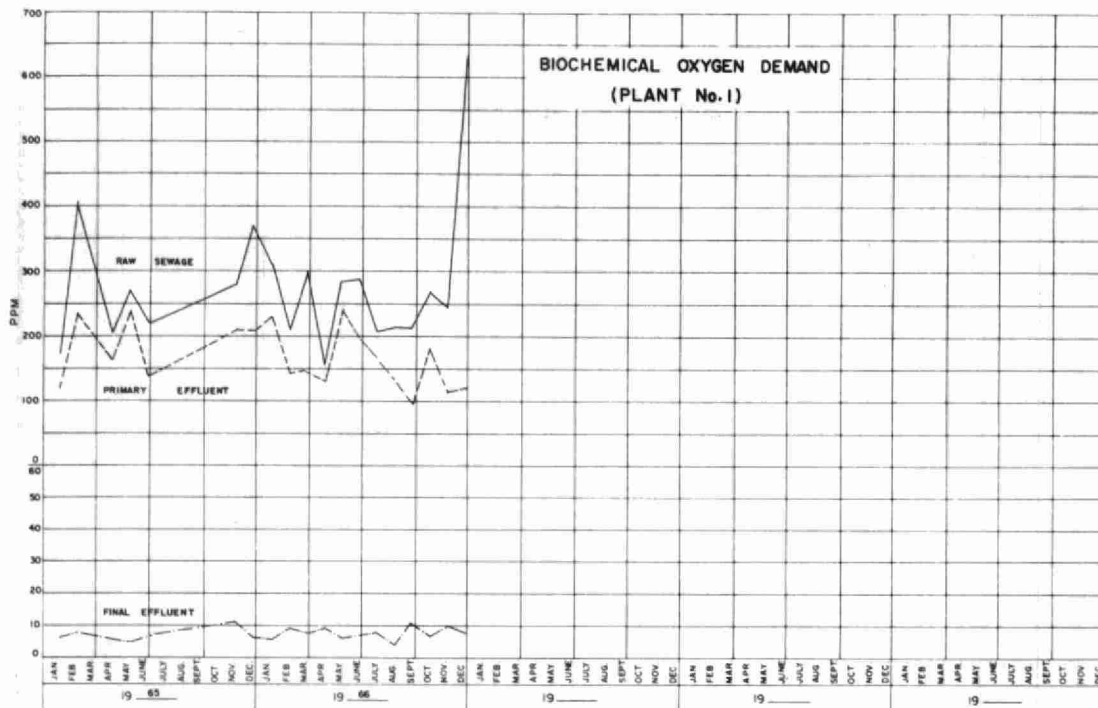
FLOW DATA

Month	Total Flow MG	Maximum Day for month MG	Average Daily for month MG	Total Monthly Flow to Plant #1	Total Monthly Flow to Plant # 2
January	48.396	2.069	1.561	16.199	32.197
February	43.239	2.203	1.545	13.459	29.780
March	55.402	2.105	1.787	17.724	37.678
April	58.485	2.191	1.950	18.752	39.733
May	57.459	2.254	1.854	20.139	37.320
June	49.711	1.887	1.657	16.625	33.086
July	48.521	1.847	1.566	15.577	32.944
August	51.093	2.438	1.649	16.116	24.977
September	56.379	2.275	1.879	16.684	39.695
October	49.352	1.854	1.592	13.020	36.332
November	51.420	1.997	1.714	11.490	39.930
December	58.932	2.475	1.901	16.853	42.079
Total	628.389	-	-	192.638	435.751

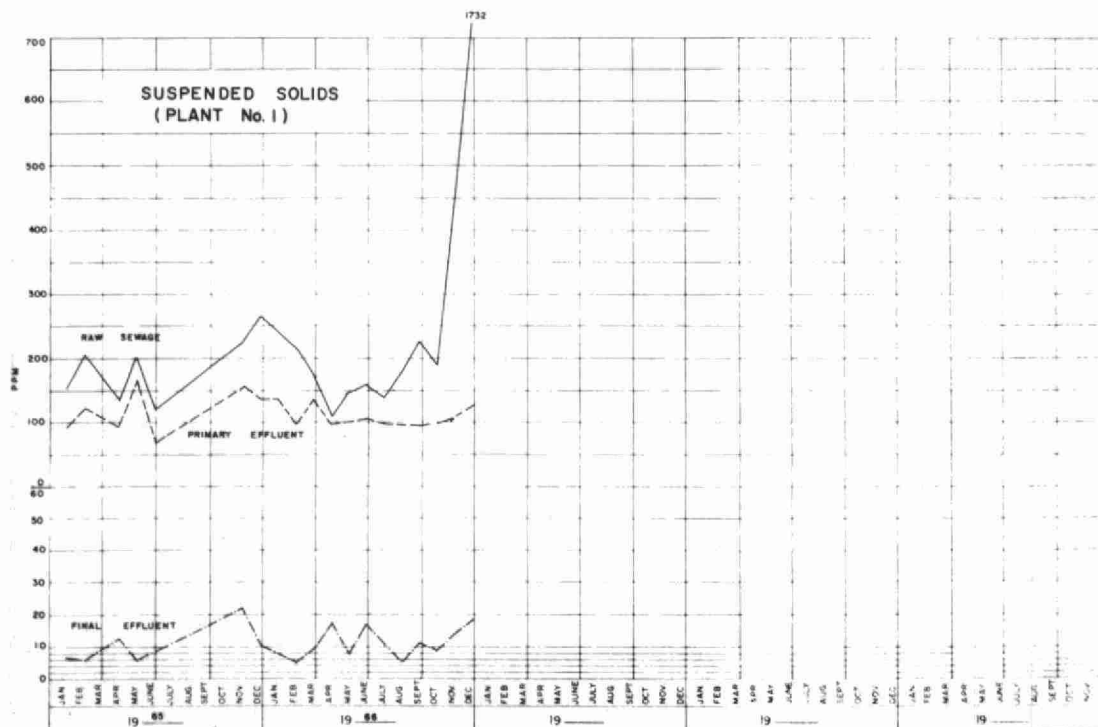
Year	Total Flow MG	Maximum Daily MG	Minimum Daily MG	Average Daily MG
1964	485.269	1.924	0.858	1.326
1965	565.531	5.701	1.016	1.549
1966	628.389	2.475	0.786	1.722







MONTHLY VARIATIONS

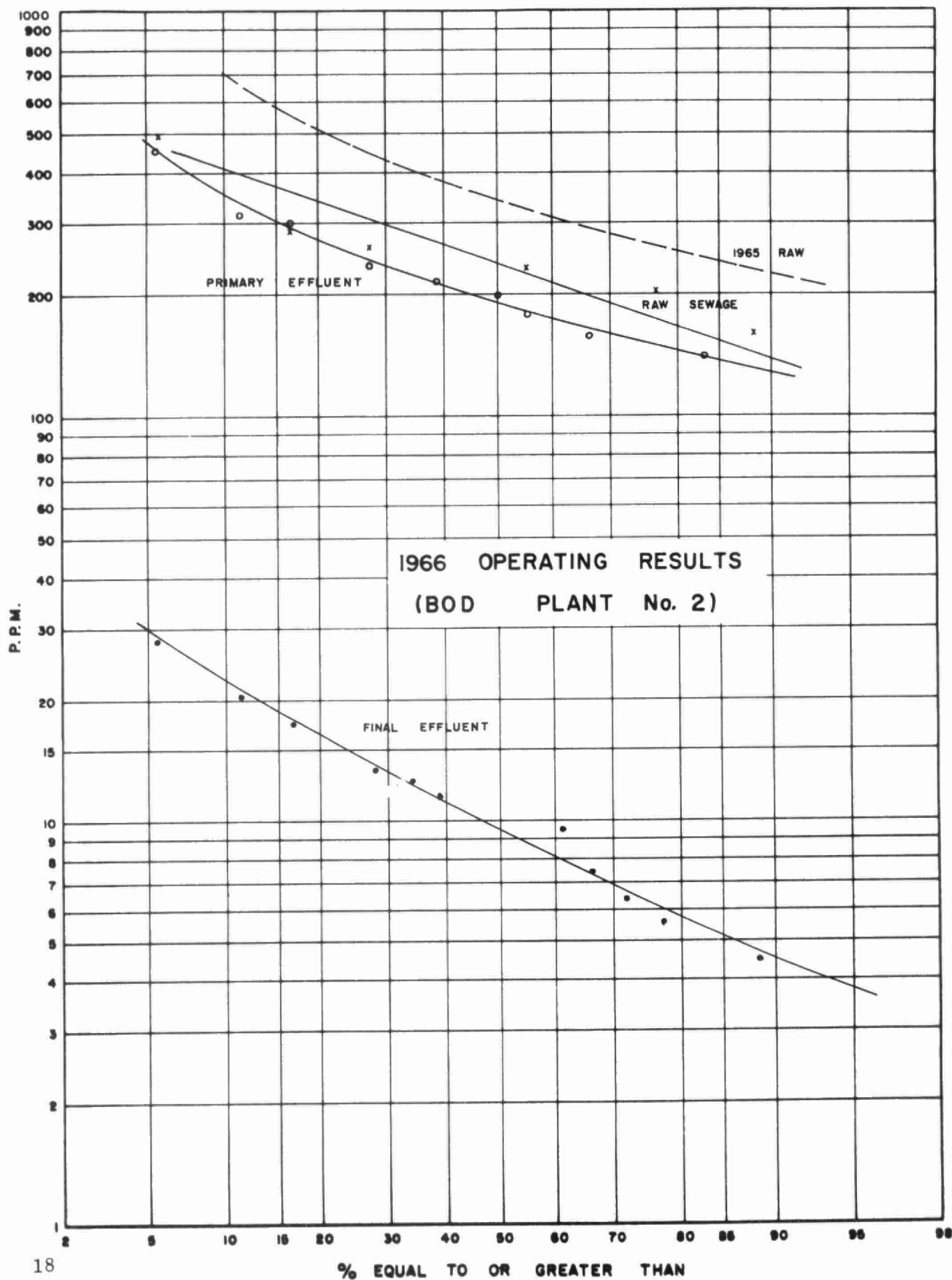


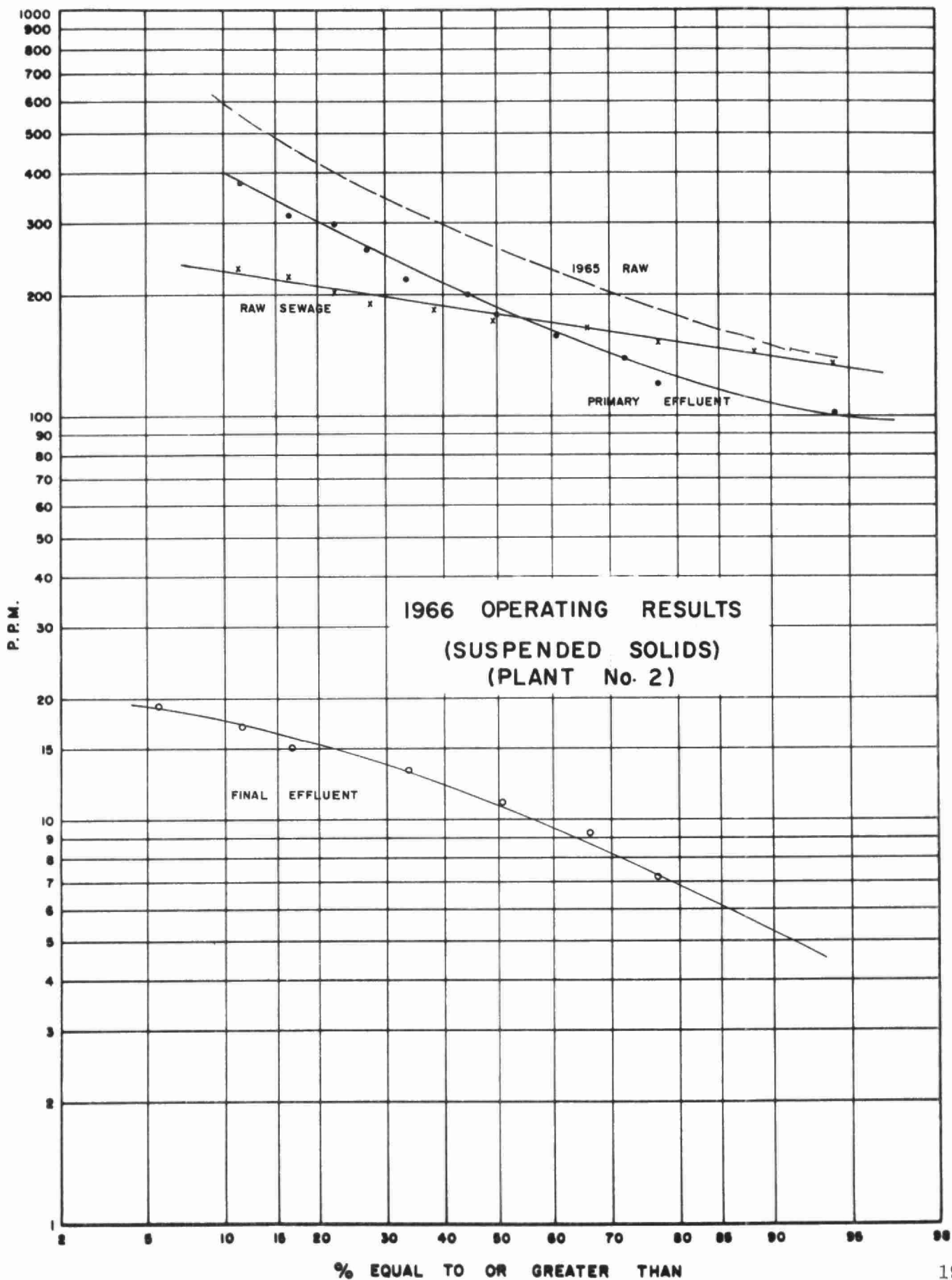
GRIT, B.O.D AND S.S. REMOVAL**PLANT # 1**

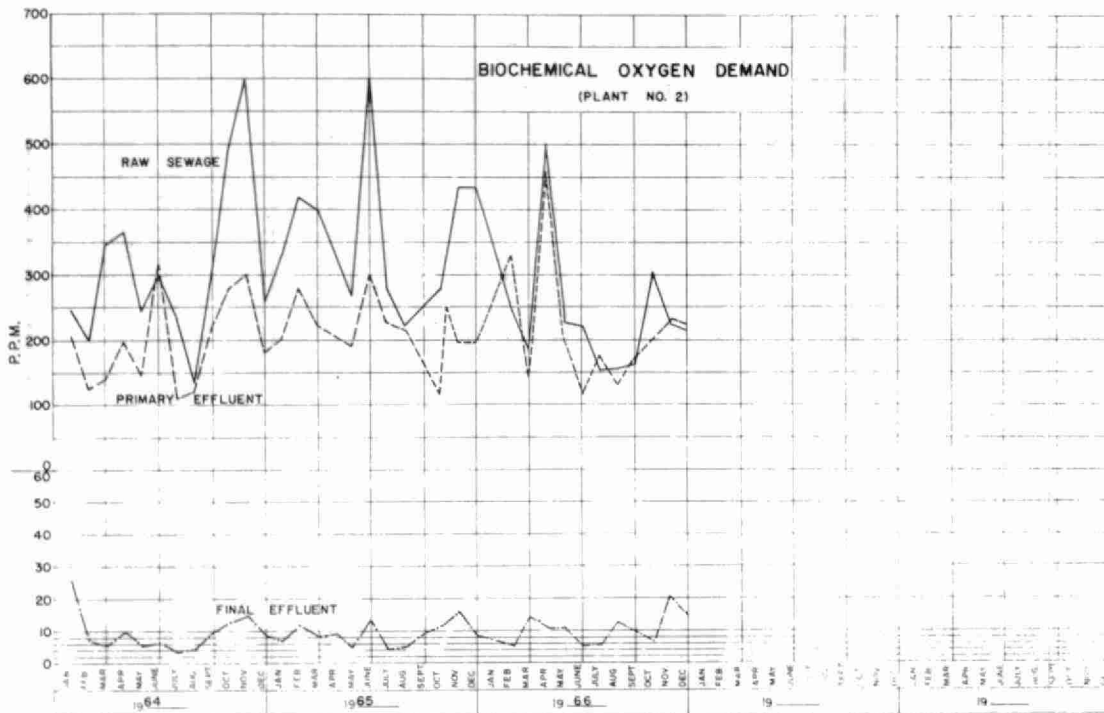
MONTH	B. O. D.				S. S.			
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED
JAN.	310	6	98.0	24.6	240	7	97.0	18.9
FEB.	210	9	95.5	13.5	214	4	98.0	14.1
MAR.	295	8	97.0	25.4	170	8	95.5	14.4
APR.	165	9	94.5	14.6	108	17	84.5	8.5
MAY	283	6	98.0	27.9	142	7	95.0	13.6
JUNE	289	7	97.5	23.4	154	16	89.5	11.5
JULY	208	8	96.0	15.6	139	10	93.0	10.0
AUG.	212	4	98.0	16.8	177	4	97.5	13.9
SEPT.	211	11	94.5	16.7	227	10	95.5	18.1
OCT.	270	7	97.5	17.1	189	8	95.5	11.8
NOV.	246	10	96.0	13.6	449	13	97.0	25.0
DEC.	610	8	98.5	50.7	1732	17	99.0	135.5
TOTAL	-	-	-	258.1	-	-	-	306.3
AVG.	276	8	97.0	21.5	328	10	97.0	25.5

COMMENTS

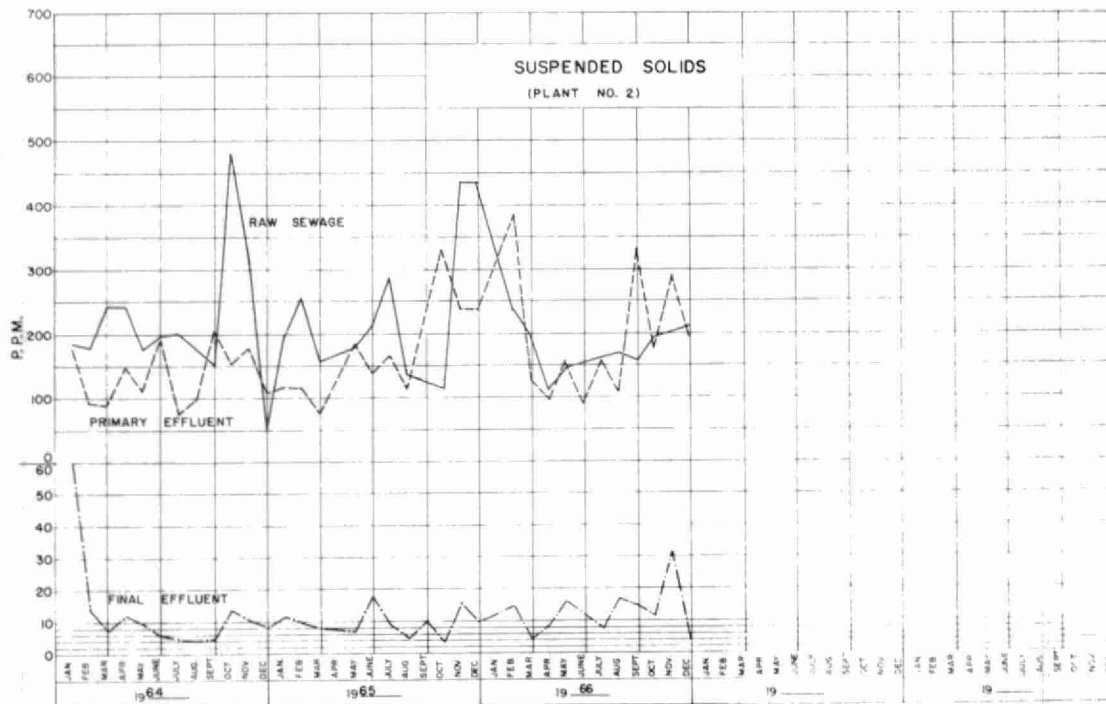
An average strength in the raw sewage of 255 ppm BOD and 252 ppm SS were received at the combined plants in 1966. The average effluent values of 8 ppm BOD and 10 ppm SS were within OWRC objectives of 15 ppm.







MONTHLY VARIATIONS



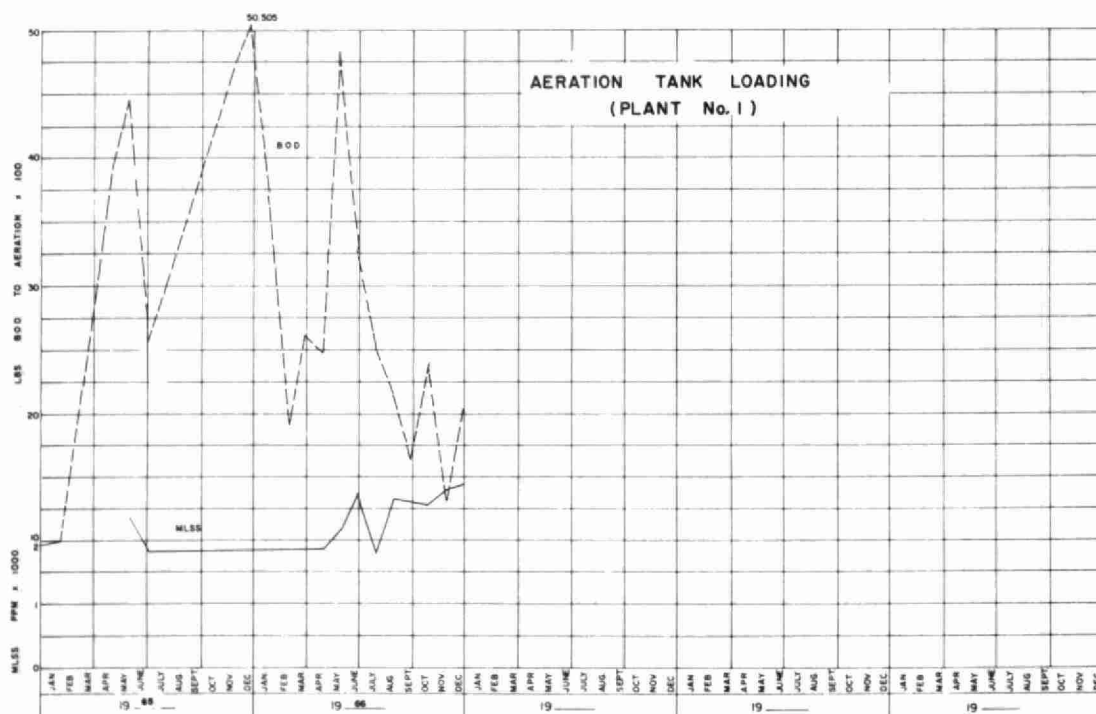
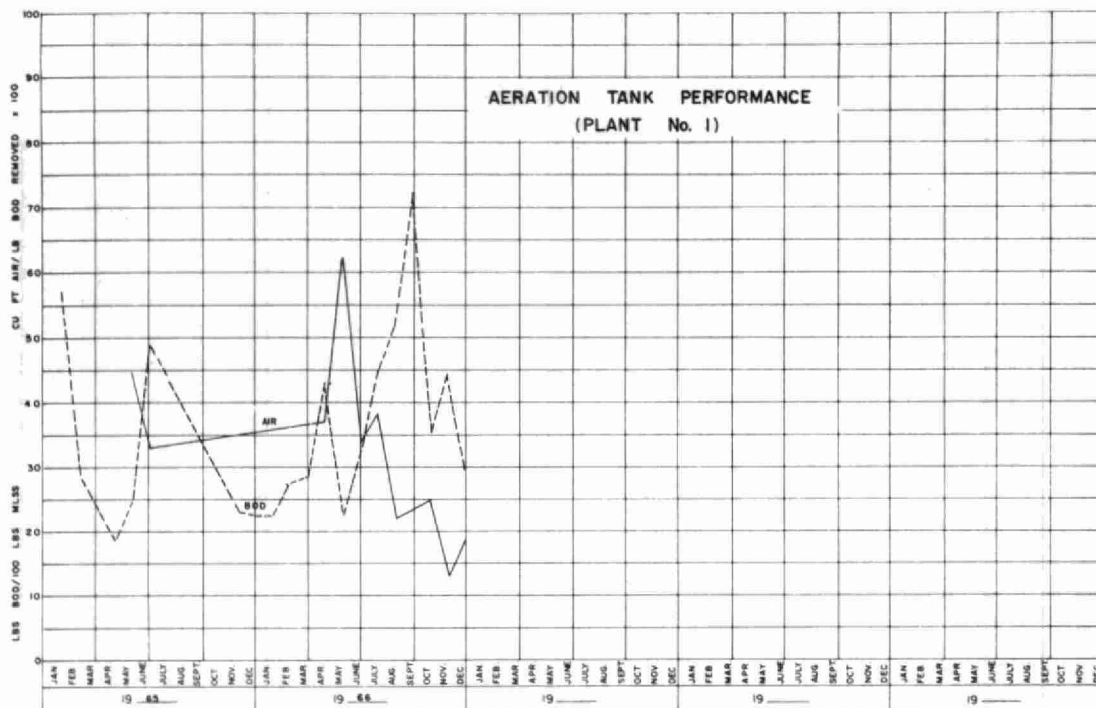
GRIT, B.O.D AND S.S. REMOVAL

PLANT # 2

MONTH	B. O. D.				S. S.			
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED
JAN.	233	10	95.5	35.9	*175	12	93.0	26.2
FEB.	250	5	98.0	36.5	232	14	94.0	21.5
MAR.	182	14	92.5	31.6	198	4	98.0	36.5
APR.	500	10	98.0	97.3	108	8	92.5	19.9
MAY	225	11	95.0	39.9	149	15	90.0	25.0
JUNE	210	5	97.5	33.9	152	11	93.5	23.3
JULY	154	5	97.0	24.5	160	6	96.0	25.4
AUG.	155	12	92.0	25.7	168	16	90.5	27.3
SEPT.	161	9	94.5	30.2	153	14	91.0	27.6
OCT.	300	6	98.0	53.4	191	11	94.0	32.7
NOV.	221	20	91.0	40.1	200	31	84.5	33.7
DEC.	210	14	93.5	41.2	210	4	98.0	43.3
TOTAL	-	-	-	485.9	-	-	-	355.1
AVG.	233	10	95.5	40.5	175	12	93.0	29.6

COMMENTS

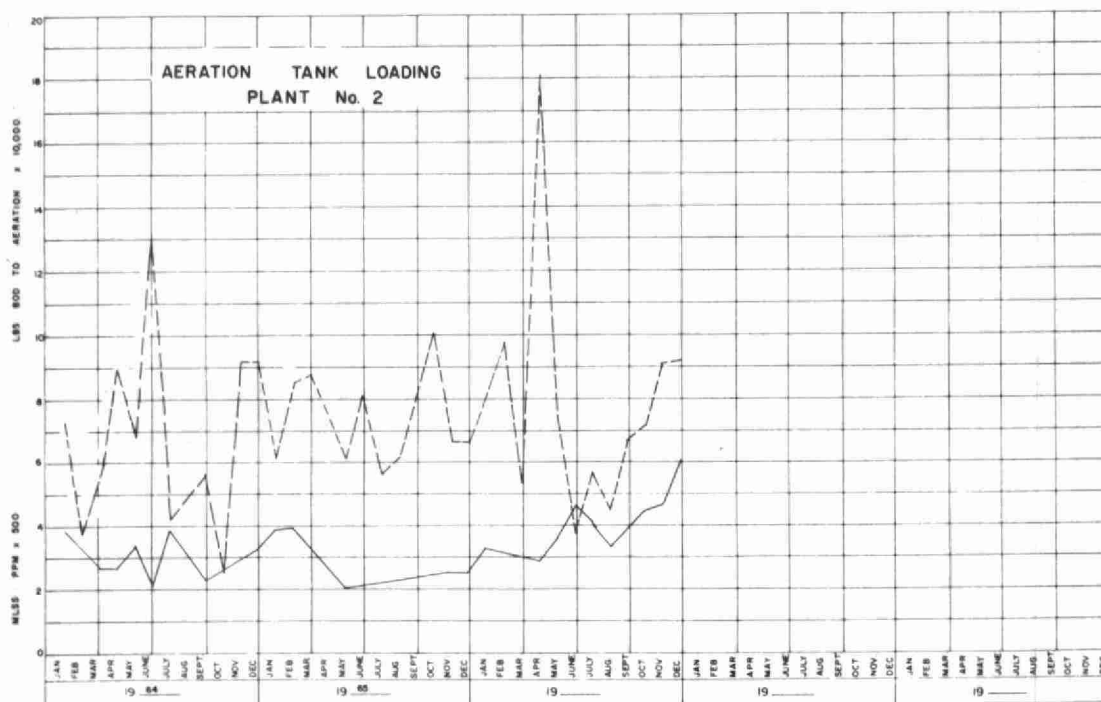
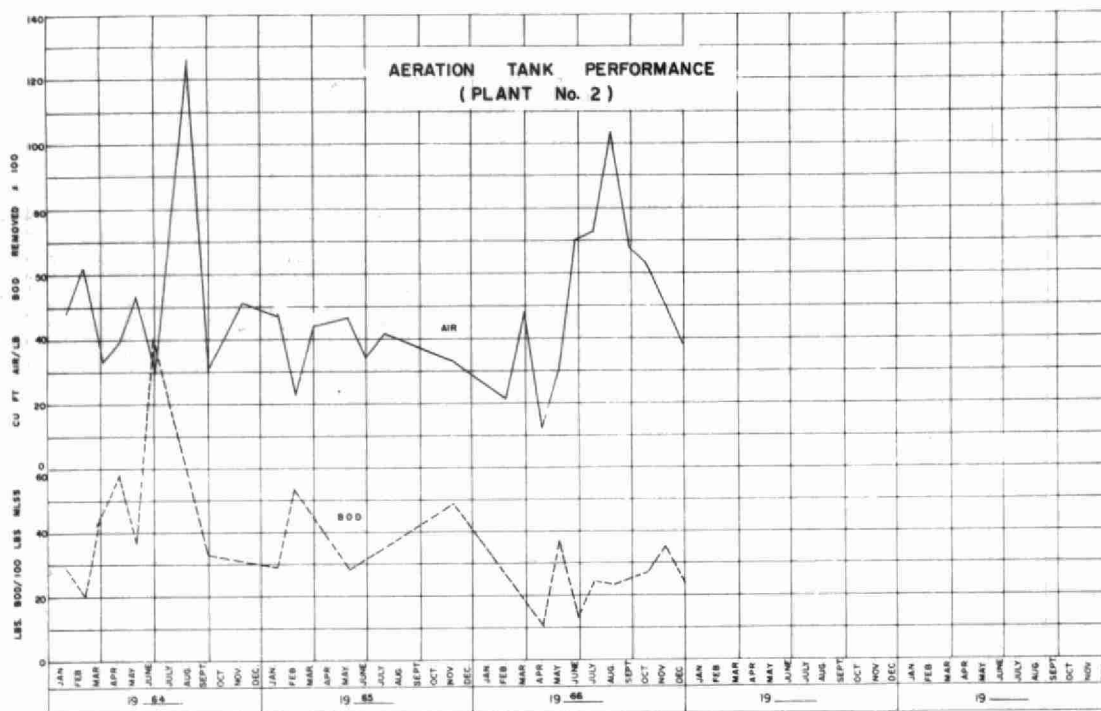
An average organic loading of 255 ppm BOD and 252 ppm Ss was recieved at the combined plants in 1966. The average effluent values of 10 ppm BOD and 12 ppm SS were within OWRC objectives of 15 ppm.



AERATION SECTION

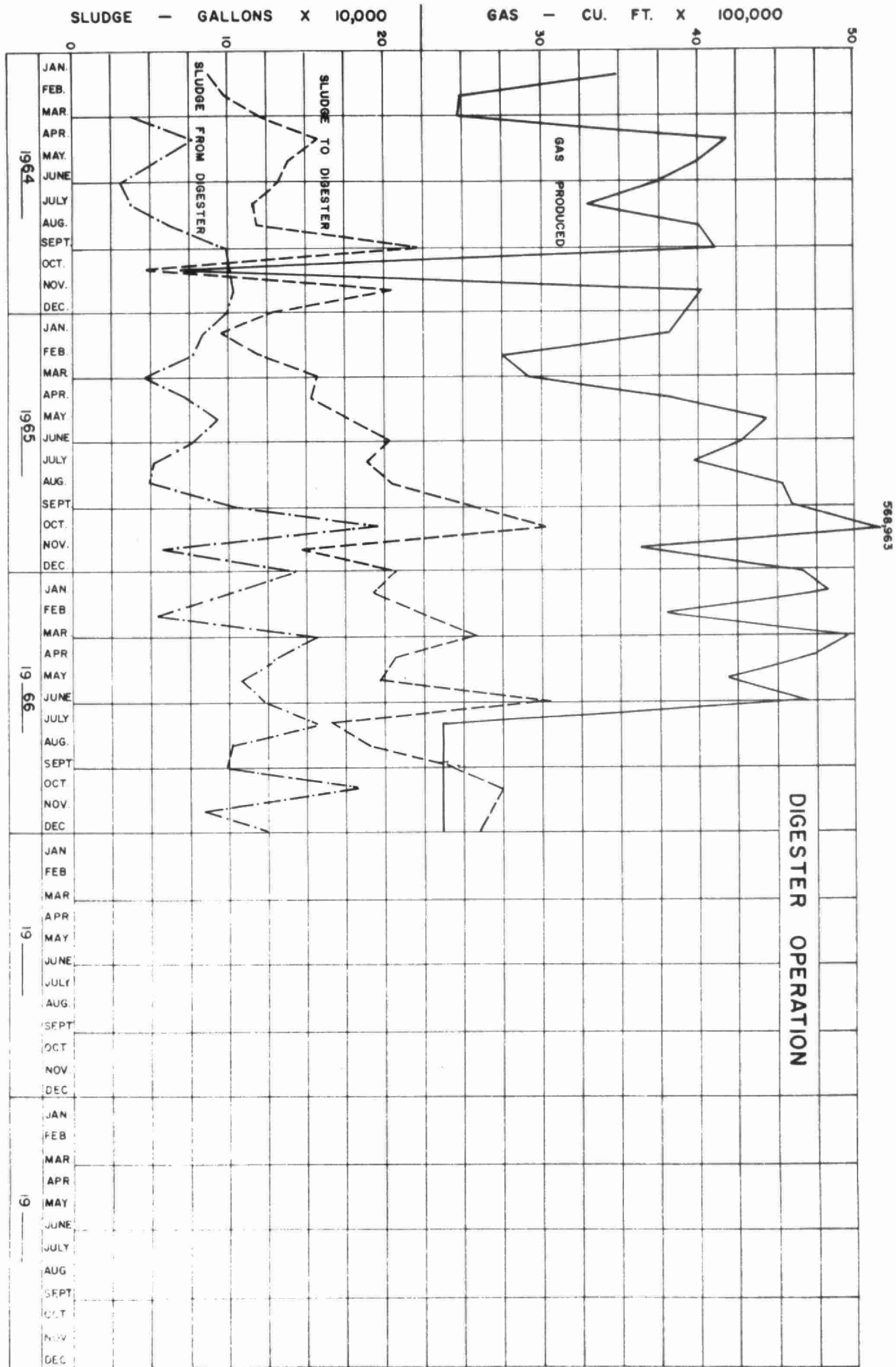
PLANT #1

MONTH	PRIM. EFFL B.O.D. PPM.	ML.SS. PPM.	LBS BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	230	-	-	2251
FEBRUARY	140	-	-	2747
MARCH	148	-	-	2839
APRIL	132	1834	37	4298
MAY	240	2111	62	2270
JUNE	198	2699	34	3261
JULY	161	1780	38	4486
AUGUST	132	2609	22	5180
SEPTEMBER	98	-	-	7128
OCTOBER	182	2527	25	3525
NOVEMBER	112	2716	13	4412
DECEMBER	120	2882	19	2837
TOTAL	-	-	-	-
AVERAGE	158	2395	31	3770



AERATION SECTIONPLANT #2

MONTH	PRIM. EFFL. B.O.D. PPM.	ML.SS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	-	1625	-	-
FEBRUARY	330	-	-	2085
MARCH	140	-	-	4702
APRIL	460	1450	11	1208
MAY	205	1750	37	3082
JUNE	114	2306	14	7017
JULY	175	2022	24	7304
AUGUST	130	1687	23	10355
SEPTEMBER	169	-	-	6802
OCTOBER	200	2230	27	6332
NOVEMBER	230	2318	35	5088
DECEMBER	220	3031	25	3892
TOTAL	-	-	-	-
AVERAGE	216	2047	24	5261



DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTERS			SLUDGE FROM DIGESTERS			GAS PRODUCED 1000'S Cu. Ft.
	1000'S CU. FT.	% SOLIDS	% VOL. MAT.	1000'S CU. FT.	% SOLIDS	% VOL. MAT.	
JAN.	30.70	-	-	15.54	-	-	408.45
FEB.	36.67	-	-	8.65	-	-	379.90
MAR.	41.58	-	-	25.00	-	-	499.58
APR.	33.04	-	-	20.67	-	-	472.86
MAY	29.91	-	-	17.31	-	-	418.22
JUNE	48.82	-	-	19.39	-	-	469.30
JULY	26.13	-	-	25.00	-	-	236.57
AUG.	30.37	-	-	16.02	-	-	* -
SEPT.	39.17	-	-	15.70	-	-	-
OCT.	44.06	-	-	29.17	-	-	-
NOV.	42.90	-	-	12.98	-	-	-
DEC.	41.81	-	-	20.03	-	-	-
TOTAL	445.16	-	-	225.46	-	-	-
AVG.	37.10	-	-	18.79	-	-	-

* Meter inoperative

COMMENTS

A total of 445,160 cubic feet of raw sludge was pumped to the digester in 1966 as opposed to 350,060 cubic feet in 1965. This is an increase of 6.7% and is once again indicative of the relatively high organic loading at this plant. The gas metering equipment failed in August and due to the excessive cost of spare parts an alternative method of determining gas quantities is presently being evaluated.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	48.396	-	-
FEBRUARY	43.239	-	-
MARCH	55.402	-	-
APRIL	58.485	-	-
MAY	57.459	-	-
JUNE	49.711	1873	4.52
JULY	48.521	2044	4.21
AUGUST	51.093	3049	5.97
SEPTEMBER	56.379	2835	5.03
OCTOBER	49.352	96	6.03
NOVEMBER	51.420	-	-
DECEMBER	58.932	-	-
TOTAL	628.389	9897	-
AVERAGE	52.365	2474	4.97

COMMENTS

Chlorine is added to the final effluent for disinfection prior to discharge to the Lynn River. Disinfection is practiced for the period from May 15 to November 1. Chlorine was also added during the past year to the raw sewage in an effort to reduce odour problems encountered during the period when the local canning industry is processing beans and onions.



CONCLUSIONS

Again in 1966 the combined plants at Simcoe operated efficiently and produced an effluent which met OWRC objectives. The cost per million gallons of \$68.23 was within the range normally anticipated for this type of operation. Renovation of the aeration piping and diffusers in plant No. 1 has been discontinued until a new source of used Sparjer diffusers can be located. An improved preventive maintenance program initiated in 1966 should be more effective in overcoming costly breakdowns.

